Water Quality

Mosquito Lagoon has been designated an Outstanding Florida Water by the State of Florida and, as part of the Indian River Lagoon, an Estuary of National Significance by the Environmental Protection Agency. It is renown for its outstanding biological diversity, recreational fishery and as habitat for several federally-protected animals. Lagoon waters are classified as Class II which is suitable for shellfish (clam and oyster) propagation and harvesting. All of these resources are dependent upon good water quality for their survival.

While current data show that overall water quality in Mosquito Lagoon is good, several characteristics make the lagoon vulnerable to pollution. Flushing is very limited - the only natural outlet is 10 miles north of the park. The shallow average depth of only four feet allows bottom sediments to be easily stirred up by wind and storms. The porous sandy soil does little to retain septic tank effluent and stormwater runoff from developed areas along the northwest boundary of the park. In fact, when it rains more than 1.5 inches over a 24 hour period, fecal coliform levels rise to the extent that shellfish harvesting must be suspended for several days until the levels subside. Recent installation of a sewer system in Bethune Beach and upgrading of the Edgewater wastewater treatment plant will be beneficial.

Estuaries, such as Mosquito Lagoon, contain brackish water, a mixture of salt and fresh water. In Mosquito salinity levels are high and frequently equal ocean levels (about 32 parts per thousand). Because of this, several fish species spawn in the lagoon that normally spawn in the ocean. Large influxes of fresh water from runoff or heavy rain can actually act as a pollutant, negatively affecting estuarine species sensitive to salinity levels. While a problem in portions of the Indian River Lagoon south of Canaveral National Seashore (CANA), salinity levels are relatively stable in Mosquito Lagoon, averaging from 28-34 ppt.

Turbidity is another important water quality parameter. Since the lagoon ecosystem is based heavily on healthy seagrass beds, water clarity is essential. Grass beds require light to conduct photosynthesis. Water that is clouded with silt or organic matter, including algal blooms caused by high levels of nutrients, prevent light penetration and limit the growth of seagrass. Water clarity in Mosquito Lagoon is very good in the winter and early spring but decreases significantly in the summer and fall.

A sufficient amount of dissolved oxygen (DO) in the water is critical value for maintenance of a healthy biological community. Values should not drop below four milligrams per liter (mg/L) for any length of time. Mosquito Lagoon's average DO value is well above that at 6.5 mg/L.

Other important values that fall within acceptable State levels are phosphorus, with an average of 1.0 mg/L, and pH, with an average of 7.9 and range of 6.5 to 8.5. Only total nitrogen exceeds standards, measuring as high as 1.5 -2.0 mg/L (the threshold

is 1.1 mg/L) in the northern end of Mosquito Lagoon. This may be a natural phenomena, since no human-related source is apparent. In the south end of the lagoon, total nitrogen averages 1.0mg/L.

Ominous signs of declining water quality can be seen in several animal species. An increasing number of juvenile sea turtles in Mosquito Lagoon and the Indian River Lagoon system are exhibiting tumors caused by the fibropapillomas virus. These tumors can interfere with a turtle's ability to feed or see and ultimately lead to death. About 10% of the bottlenose dolphins in the Indian River Lagoon have contracted *Lobo mycosis*, a fungal infection. Both the virus and fungus are connected to poor water quality.

A large quantity of water quality data has been collected in Mosquito Lagoon by a number of federal, state and local agencies. However, these efforts are not being coordinated. The park is currently working with The U.S. Geological Survey to identify and coordinate all water quality monitoring activities. This data can be used to assess long-term changes in water quality, identify specific sources of pollution and determine actions needed to protect lagoon waters.

In 2000, CANA began to monitor water quality at beach areas in the North and South districts to ensure visitor safety. Data is collected every two weeks in the South District by Brevard County and once a month in the North District by park staff. To date, only one poor rating has been recorded. Since this did not reoccur, the rating may have been due to sampling technique.